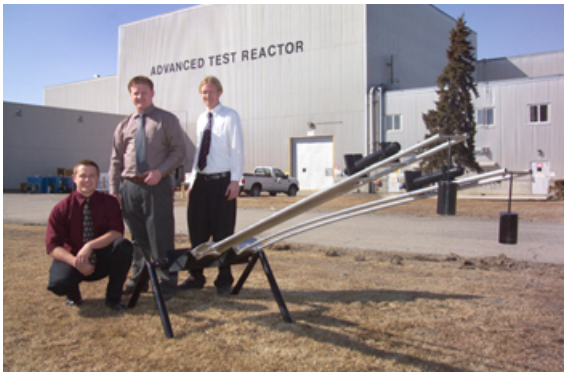

BYU-Idaho seniors Bob Woestman, Eric Bodily, Devin Taylor and Roy Withers (not pictured) designed improvements to a reactor core inspection tool and built two prototypes for their senior year mechanical engineering "capstone" project.

Local students redesign Advanced Test Reactor tool

Engineering students from Brigham Young University-Idaho are getting real-world experience through Idaho National Laboratory's Advanced Test Reactor (ATR). Seniors in the mechanical engineering program have spent the past few months designing improvements for a tool used to inspect the reactor's internal components for signs of wear.

The students recently presented their design plans and prototypes to ATR operators and engineers. The group was impressed with the students' solutions and expects to incorporate them into a new tool design.

The project is part of a university program that lets students tackle real-world problems using the skills they've learned in the classroom. BYU-Idaho students have completed several such "Capstone Projects" at the ATR and other INL facilities.

"It's definitely a win for our students," said Aaron Schellenberg, a BYU-Idaho mechanical engineering instructor. "The students gain the opportunity to do a real engineering project similar to what they would do if they were hired in the industry."

This trimester, BYU-Idaho seniors Eric Bodily, Devin Taylor, Roy Withers and Bob Woestman designed improvements to a tool ATR operators use to examine reactor core internal components.

Blocks of beryllium surround the reactor core to reflect neutrons and help create high neutron flux for experiment specimens. The narrowest sections of the blocks can become brittle over their lifetime, causing the beryllium to crack. So operators periodically check the blocks for cracks when they conduct planned reactor shut-down activities.

The beryllium inspection tool is basically a long-handled periscopic device. Operators standing atop the reactor lower the tool through 20 feet of water and into the narrow space where reactor fuel normally resides. The tool's underwater camera cannot go into the core itself, so a lighted mirror at the end of the tool reflects an image of the beryllium block into the camera above.

Because the camera sits more than four feet above the mirror, operators need a super-steady hand to get a clear picture. That's where the BYU-I students come in - they spent the trimester designing improvements.

"We hope that it will be easier to use and less susceptible to lateral forces from the operator," said Phillip Cox, an ATR reactor operator who helped the students understand the challenges and was impressed with the changes they devised. "They did a good job," he said.

Eric Bodily, a mechanical engineering major at BYU-Idaho, speaks to engineers and operators from INL's Advanced Test Reactor as classmate Bob Woestman looks on. Their four-student team designed improvements to a reactor core inspection tool and built two prototypes (at right) for their senior year "capstone" project.

The students chatted with ATR operators and engineers after the presentation, answering questions about their findings and discussing other potential modifications. Three collaborating groups - ATR Operations, ATR Engineering and the ATR Reactor Instrumentation and Control Shop - will evaluate the students' design and may use their suggestions to fabricate a new inspection tool.

Past capstone projects have yielded designs for other tools and systems at ATR facilities, said Brandon Moon, a BYU-Idaho mechanical engineering alum who oversees ATR capstone projects.

Other INL teams have benefited as well. Terry Turner, an INL research and design engineer, was pleased with a past BYU-Idaho design and participated in the program again this year. Turner's team explores strategies for cleaning two-stroke engine exhaust without degrading power. The students contributed a design to refurbish a dynamometer, which measures engine power.

"We could have easily built our own, but having them do it saved us some money and provided them with an opportunity to learn," Turner said. INL researchers pay a $2,000 sponsorship fee to participate in a BYU-Idaho capstone project.

"I think it's an excellent program," Turner said. "It's a good teaching tool and brings quite a bit of value to the lab."

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Feature Archive